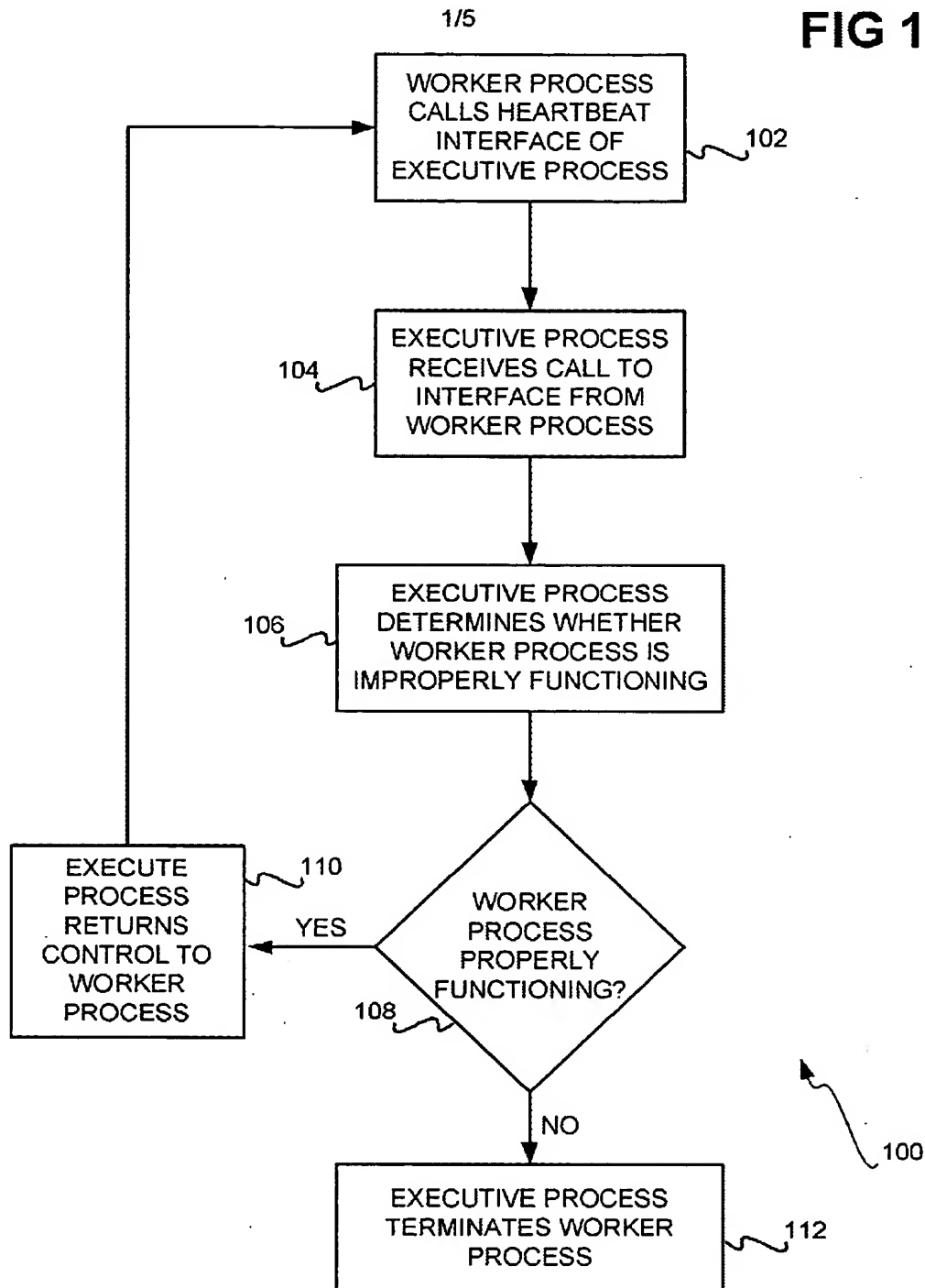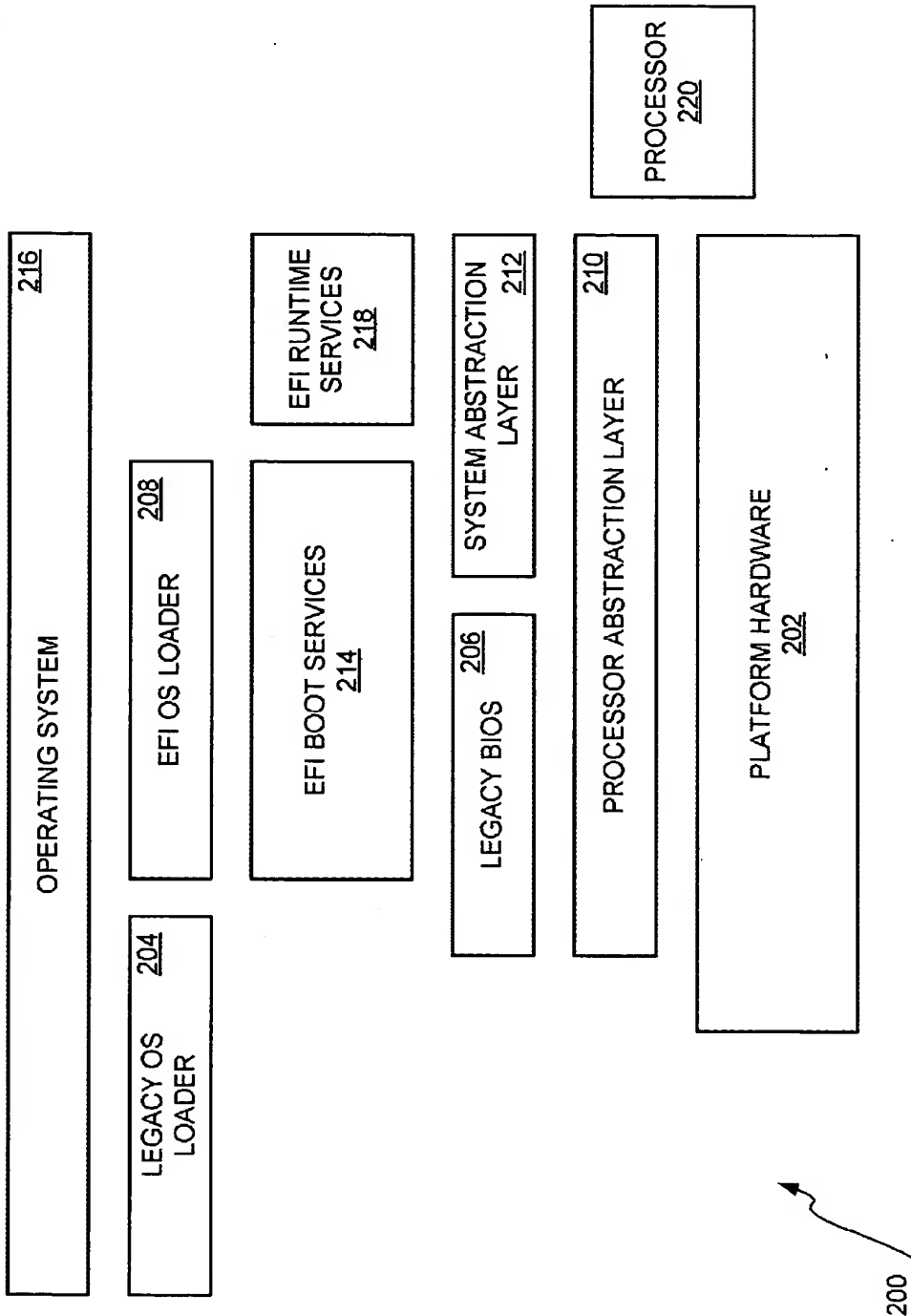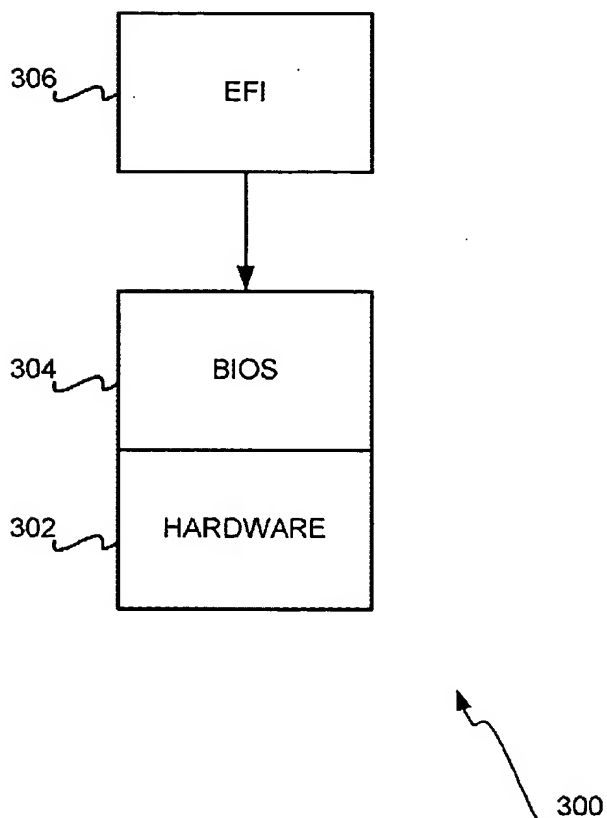Methods and apparatus for monitoring a lower
priority process by a higher priority process
First named inventor: Fred A. Bower III   Application no. 10/040,130

**REPLACEMENT
SHEET**

1/5

FIG 1

```
                    ┌─────────────────────┐
                    │  WORKER PROCESS     │
            ┌──────▶│  CALLS HEARTBEAT    │
            │       │  INTERFACE OF       │  ∿ 102
            │       │  EXECUTIVE PROCESS  │
            │       └─────────────────────┘
            │                 │
            │                 ▼
            │       ┌─────────────────────┐
            │       │  EXECUTIVE PROCESS  │
            │   104 │  RECEIVES CALL TO   │
            │    ∿  │  INTERFACE FROM     │
            │       │  WORKER PROCESS     │
            │       └─────────────────────┘
            │                 │
            │                 ▼
            │       ┌─────────────────────┐
            │       │  EXECUTIVE PROCESS  │
            │   106 │  DETERMINES WHETHER │
            │    ∿  │  WORKER PROCESS IS  │
            │       │  IMPROPERLY         │
            │       │  FUNCTIONING        │
            │       └─────────────────────┘
            │                 │
            │                 ▼
┌──────────────┐           ◇◇◇◇◇◇◇◇◇
│  EXECUTE     │ ∿110    ◇◇         ◇◇
│  PROCESS     │       ◇◇  WORKER     ◇◇
│  RETURNS     │ YES  ◇◇  PROCESS      ◇◇
│  CONTROL TO  │◀─────◇◇  PROPERLY     ◇◇
│  WORKER      │      ◇◇  FUNCTIONING? ◇◇
│  PROCESS     │       ◇◇            ◇◇
└──────────────┘   108  ◇◇         ◇◇
                    ∿     ◇◇◇◇◇◇◇◇◇
                              │
                              │ NO                  ▲
                              ▼                     │  ∿ 100
                    ┌─────────────────────┐
                    │  EXECUTIVE PROCESS  │
                    │  TERMINATES WORKER  │  ∿ 112
                    │  PROCESS            │
                    └─────────────────────┘
```

Methods and apparatus for monitoring a lower
priority process by a higher priority process   **REPLACEMENT**
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FIG 2

PROCESSOR 220

OPERATING SYSTEM 216

EFI OS LOADER 208

LEGACY OS LOADER 204

EFI RUNTIME SERVICES 218

EFI BOOT SERVICES 214

SYSTEM ABSTRACTION LAYER 212

LEGACY BIOS 206

PROCESSOR ABSTRACTION LAYER 210
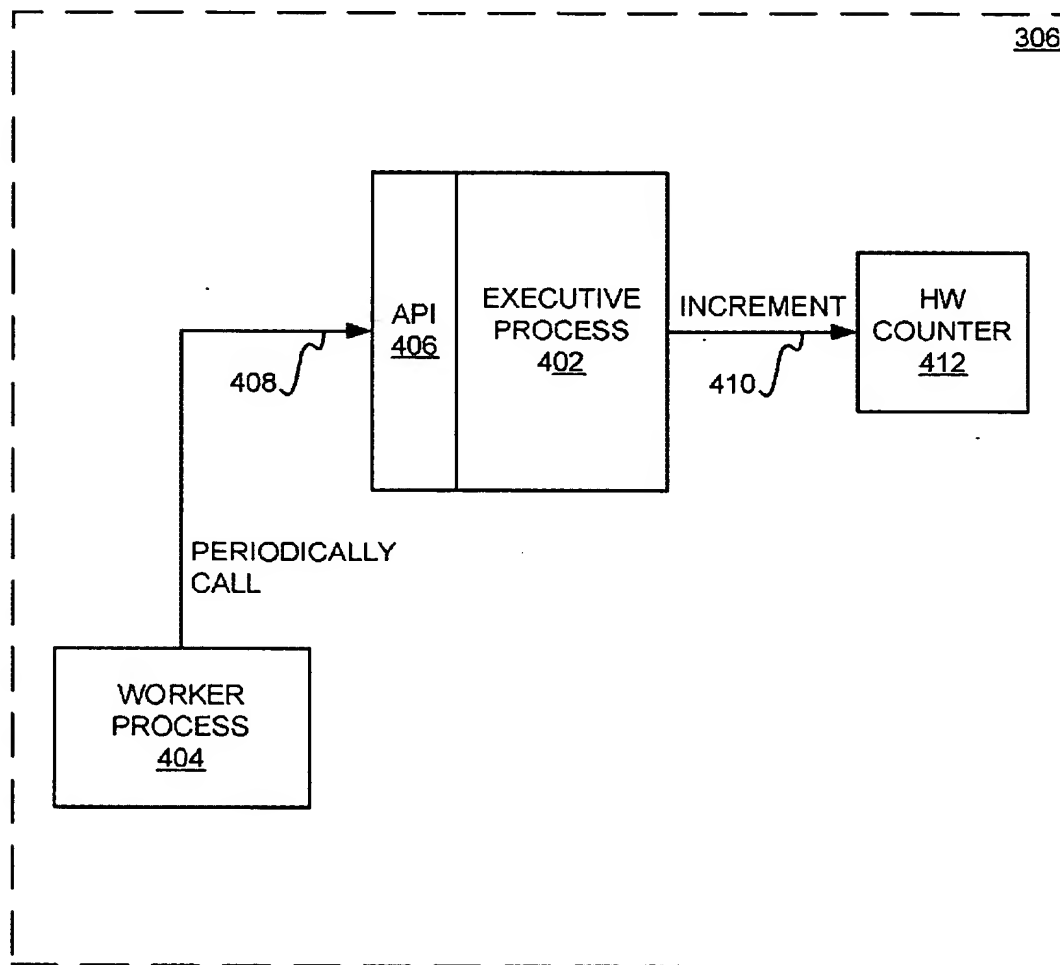
PLATFORM HARDWARE 202

200

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First named inventor: Fred A. Bower III   Application no. 10/040,130

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3/5

FIG 3

306 ⌇ | EFI |

| BIOS |

304 ⌇

302 ⌇ | HARDWARE |

300

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4/5

FIG 4

306

API
406

EXECUTIVE
PROCESS
402

408

INCREMENT

410

HW
COUNTER
412

PERIODICALLY
CALL

WORKER
PROCESS
404

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First named inventor: Fred A. Bower III   Application no. 10/040,130

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5/5

FIG 5

502 — INITIALIZE ENVIRONMENT

504 — PROCESS COMMANDS

508 — WORKER RUNS ← 506 LOAD WORKER

510 — CALL HEARTBEAT API → 512 INCREMENT HEARTBEAT

REMOVE WORKER? 514
- NO
- YES

WORKER DONE? 516
- NO
- YES 517

518 REMOVE WORKER

520 DIAGNOSE CAUSE OF PROBLEM

522

524 EXIT